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The Three Camps of Science Policy

Tracking the Remedies for the "Crisis" in Science

A debate over budget strategy has slowly been building up among the statesmen of science in Washington, and as money gets tighter and policy choices proliferate, SGR deems it useful to mark important positions and ideas and their exponents. They cluster around three basic points or combinations of them:

(1) Fundamentalism, which holds that science should not be subjected to financial constraints, regardless of what the pennyminders prefer.

(2) Political realism, which argues that science merits rapid growth and generous support, but, sadly, must make some concessions to economic and political constraints.

(3) Structuralism, which sees science as reasonably well financed, but lacking priorities and the willingness or means to extract better value from existing support.

Presiding over the fundamentalist camp, which tolerates no deviation from the simple solution of more money quickly, is Nobelist Leon Lederman, President of the American

President of the National Academy of Sciences, who calls for more, but with reservations based on his experienced readings of the political terrain. Last January, when the Academy provided its auditorium for Lederman's budget-busting pitch, Press followed him to the rostrum, politely expressed thanks, and then noted that "No nation can write a blank check for science."

Safe with that truism, Press told his annual meeting on April 30 that a doubling of all federal science budgets "should be a goal for the 1990s"—starting with a \$2 billion boost next year. But Press conceded that "Because of the budget agreement [to restrain federal spending], full realization may not be possible in the next few years."

Several years ago, Press bravely ventured into new

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Friends Rally to Aid Baltimore—P.4 *NSF Resists Move to Suburbs—P.6*

Association for the Advancement of Science. Confident, cheerful, and oblivious of political reality, Lederman argues that science more than pays back its keep and therefore shouldn't be modest in seeking government support. Lederman's brief, *Science: The End of the Frontier?* [SGR, January 15, "AAAS Head Toots Tin Trumpet for Science Funding"], calls for a swift doubling of the present federal \$10 billion in basic-research funding, followed by increases of 8-10 percent a year. With the sublime confidence of his scientific discipline, Lederman draws deep meaning from an amateurish survey of 240 scientists, most of whom declared themselves unhappy about money for their work.

Lederman offers no suggestions for finding many additional billions in Washington's stringent budget system, apart from a chimerical proposal for a science tax on high-tech consumer goods. But he expresses certainty that, by the end of the decade, his goals will be realized. He was initially received as a charming though hopeless presence in Washington science politics. But, like a vibrant country preacher, Lederman is in fact quite rousing, and some early scoffers now privately credit him with invigorating the debate over money for science.

Epitomizing the political-realist position is Frank Press,

In Brief

The European Space Agency says it's dismayed by another downturn in the fortunes of the space station, zeroed out by a House Subcommittee. But embassy sources in Washington tell SGR that NASA's European partners would not be displeased by a drop in space obligations. With the recession hanging on and Germany burdened by the costs of reunification, the venture has declined in European priorities, and ESA members are pleased to let the US take the rap for a turnabout.

NASA's Japanese partners have found an occasion for lecturing the US about reliability in international high-tech collaboration—a tender issue, given the erratic US record in these matters. Warning that it might go it alone in space if the space station does not proceed, the Japanese government said that it might also have to reconsider the wisdom of other big collaborations. The reference obviously was to the Superconducting Super Collider, for which the US has been begging for money for three years, without success.

The House has defeated an attempt to kill the SSC, and approved \$434 million for next year. That's \$100 million below the Administration request, but about double the amount appropriated for this year. Support for the SSC gained from a \$10 million sop for a new injector at the Fermilab after it was cut in committee.

Signs of the ceaseless struggle facing public relations folks and other image builders, from a correction in the May 17 New York Times: "An article on the Education Page on Wednesday about grants to improve science programs misidentified the National Science Foundation. It is a government agency, not a private organization."

... Heresy in Saying Money Is Not Main Problem

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policy areas by espousing the development of priority standards for federal support of science and technology. That's dangerous talk in Washington, since anything acknowledged as less than top priority automatically draws the budget cutters. Press's proposals, however, were never sharply defined. They evoked some interest, but that faded when he failed to pursue the theme. His latest policy speech, "Talking Our Way Into Scientific Decline," delivered at the Academy's April meeting, is off-the-shelf oratory.

In general sympathy with Lederman and Press on the need for more money, but maintaining the discretion required of Presidential appointees, is Walter Massey, Director of the National Science Foundation. In office only since February, and still feeling his way, Massey discreetly speaks of the economic importance of research and more research. He shies away, however, from anything specific beyond the Bush Administration's commitment to a five-year doubling of the NSF budget by 1994. Calling for more would bring down the wrath of Budget Director Richard Darman and White House Chief of Staff John Sununu.

But in an interview in Paris with SGR prior to taking office [SGR, February 1], Massey spoke of the need for "more funding, more money in some areas." In response to the assertion that "There is no more money in the present budget situation," Massey replied, "Well, I don't know. There's always more money."

Bernadine Healy, newly installed as Director of the National Institutes of Health, concedes that during her Reagan-era service in the White House Science Office, she was skeptical about the cries of fiscal deprivation coming from the biomedical community. But true to the tradition of agency chiefs going native, she's now a believer in the need for more money for NIH. When Healy's immediate predecessor, James Wyngaarden, headed NIH, he indulged himself in the relative political autonomy of the post and said a doubling of the budget would be about right. So far, Healy has not declared any great budget aspirations. But one of her first innovations in office, the so-called Shannon Awards, will provide \$50,000 grants to sustain near-miss grant applicants until the next competitive round. Its effect will be to add to the clamor for more money by providing a lifeline for many researchers who would otherwise drop out of the system.

The structuralist camp is thinly populated and offers few texts on the thesis of doing better with what we have. One of the most innovative and stimulating offerings in this category was delivered by Robert M. White, President of the National Academy of Engineering, at the October 1990 annual meeting of the NAE. Titled "Science, Engineering, and the Sorcerer's Apprentice," White's speech openly contested the standard gloomy assessments of the fiscal state of American science. Even today, some of White's fellow mandarins distastefully look back upon the speech as aid and

comfort to the enemy.

Noting that despite ever-increasing complaints about the adequacy of federal support for science, government funding has actually grown rapidly in recent years, White said, "It is tempting to take the position that additional funding will solve our problems. Obviously, it would, for some of them, but only for a while. The problems unfortunately are deeper. We have a crisis of rising expectations that will not be met. The R&D enterprise is going through a shake-out not unlike that in industry when there are too many players for the size of the market. And like shake-outs in the private sector," White continued, "there is a need to manage the process wisely to ensure the vitality of the whole R&D enterprise."

From that heresy, White proceeded to another: "There may also be a fundamental mismatch between what the nation needs from the research and development enterprise and from what the science and engineering community wants. It may be time that we think about whether our concern for the support of the science and technology enterprise has diverted us from attention to how we can best serve national needs."

In his 1990 address, White nodded respectfully to another figure in science-policy affairs, Erich Bloch, who had recently stepped down after six years as Director of the National Science Foundation. White noted that in a parting interview with *Physics Today*, Bloch said, "The awful truth is that no scientific discipline will ever again be fully funded. Very clearly the system has outgrown the capability to support it."

The assertions were characteristic Bloch. Unlike other occupants of senior federal science posts, Bloch criticized the policies of the Administration he served—which perhaps accounts for his rapid departure upon completion of his term. Bloch often deplored the large share of federal R&D resources controlled by the Pentagon—well over 70 percent at the high point of his NSF tenure. And he openly questioned whether the nation was receiving good value from the

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... Nostalgia for the Non-Existent "Golden Age"

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\$20 billion a year expended in government-owned laboratories.

The most outspoken structuralist today is Roland W. Schmitt, President of Rensselaer Polytechnic Institute, who acknowledges insights from the Engineering Academy's Robert White. Formerly Vice President for Research at General Electric, Schmitt has also served as Chairman of the National Science Board, NSF's policymaking body. He's a savvy observer of the science-policy scene.

Schmitt dismisses Lederman with the observation that "A call to battle is more exciting than a call to regroup. But unfortunately, we cannot bet our future on the probability that Leon's [Lederman's] proposal will succeed—it won't."

Schmitt then proceeds to disassemble Lederman's arguments. In testimony on March 20 before the House Science, Space, and Technology Committee, Schmitt referred to Lederman's wistful recollection that 1968 "was the peak year of what we call the Golden Age" in federal support of science. Schmitt, collecting the numbers on federal support and reviewing survey data on attitudes of researchers, reported finding a curious dissonance: At present, he said, "We are back to per capita expenditures near those of the 'golden era' of the late 60s, but complaints are at a fever pitch."

"The curious fact," he added, "is that young physics faculty felt best in 1977, after several years of diminishing support and felt worst after the sustained growth in per capita support during the 1980s." A major difference today, Schmitt says, is the vast extension of federal research support to institutions formerly outside the system. Between 1971-73 and 1987-89, he reported, the number of academic departments receiving federal research funds grew almost 22 percent in engineering and almost 50 percent in the life sciences. At the same time, "research intensity" has grown, as revealed by the growth of the number of postdocs engaged in academic research, from 4300 in 1973 to 10,300 in 1989.

Schmitt bows to the political necessity of tolerating the spread of research. "But that doesn't mean," he says, "that every campus aspiring to eminence in research has to be comprehensive in research. We ought to be encouraging different clusters of excellence at different campuses. And we can do this if proposals were to be judged not on intrinsic merit alone, but also on context—is the work linked or synergistic to other work on campus?" He also urged greater sharing of expensive facilities. And on manpower, he questioned the growing reliance on postdocs at the apparent expense of support for undergraduate and graduate science students. Schmitt falls short of sketching a blueprint for drastic reform, but he goes as far as any of the elders of science in suggesting that the money "crisis" is a symptom of mismanagement, rather a mere fiscal shortfall.

The positions of the President's Science Adviser, D. Allan Bromley, on science- and technology-policy issues

are often clear, but not always. On money for research, Bromley is on record with the safe assertion that "the United States underinvests in science." Sununu and Darman are sympathetic to the needs of science, and therefore the White House atmosphere is congenial for the cause. But fiscal discipline is highly valued and strictly enforced by Bush's inner circle, which regards Lederman's goals as preposterous. Bromley depicts himself as a dedicated campaigner for more money for science. But he's not wasting his political capital or time arguing for an overnight \$10 billion boost for basic research.

The risks of getting too far ahead of his political leaders recently led to a painful lesson in public for the Presidential Science Adviser. Under a headline "White House Reversing Policy Under Pressure, Begins to Pick High-Tech Winners and Losers," *The Wall Street Journal* reported on May 13 that opposition to helping high-tech industry was diminishing in the Bush Administration. Referring to Bromley as one of the architects of the reported turnabout, the *Journal* stated that "Mr. Bromley says—and White House economic officials confirm—that he has won Mr. Darman's approval to aid the biotechnology and the materials processing industries. . . . Mr. Bromley, a former Yale nuclear physicist who is a friend of the president, has played a big role in shifting the administration's attitude toward commercial technology."

Several days later, Bromley's office contritely disputed the *Journal's* report in a statement that said nothing has changed: "The Bush Administration's basic policy principles in this area were stated clearly during the 1988 campaign and have been unchanged since. These principles are inconsistent with an industrial policy of targeting particular industries for support or particular technologies for commercialization."

Technology policy is thus heavily laced with ideological and political considerations. On science policy, however, there's general agreement across the political and economic spectrum that science is a public good that merits ample federal support. The arguments are over how much, and the discussions tend to be layered with doomsday prophecies and voodoo incantations drawn from analyses of Nobel Prize awards, science spending as a percentage of national GNP, and literature citations.

A real difficulty is in simply determining what's going on out there. And the science establishment has mysteriously, perhaps deliberately, generally shunned information gathering that might illuminate the realities involved in the care and feeding of science. Several disciplines, most recently astronomy, are overflowing with self-congratulations about candidly ordering their priorities for federal support. But in federal budget-making circles, these supposedly objective studies are suspiciously regarded as merely a more sophisticated brand of special pleading.

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Baltimore's Backers Rally to Retain Rockefeller Post

Confidential minutes of a meeting at the National Academy of Sciences reveal the organization of a letter-writing campaign by leading scientific figures urging the trustees of Rockefeller University to retain David Baltimore as President of the University.

There's been no public indication of a threat to Baltimore's hold on the prestigious Rockefeller post, which he has held since September 1990. But the possibility of a downfall has aroused speculation since the National Institutes of Health completed a draft report in March concluding that a colleague of Baltimore's had faked data in a jointly authored paper published in *Cell* in 1986 [SGR, April 1: "Squalor in Science: A Review of the 'Baltimore' Case"].

Baltimore, a Nobel laureate, was not implicated in the commission of the fraud, but he was strongly chastised in the NIH report for his unrelenting defense of the paper. NIH described his behavior in the long-running investigation and public dispute as "extraordinary," "deeply troubling," and

"startling."

He has since publicly apologized and declared that government has a right to accountability for use of its scientific funds. The resort to a letter-writing campaign suggests that the trustees may not be solid on Baltimore's retention.

The Academy-based gambit in Baltimore's behalf was organized on April 29, during the NAS annual meeting, at one of the organization's many disciplinary units, the Section of Cellular and Developmental Biology. (Baltimore, who attended the annual meeting, is a member of another Section; the minutes do not indicate he was present at the letter-writing discussion.)

According to the minutes, obtained by SGR, a longtime Baltimore supporter, Bernard Davis, Professor emeritus at Harvard Medical School, "brought up the 'Baltimore' case."

"Summarizing Bernie's point," the minutes state, "a
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Science Policy

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Befuddled by the science establishment's conflicting assertions about the adequacy and priorities of federal support for science, Congress has adopted a two-pronged response: It increasingly looks upon science as a pork-barrel item but it also wants independent advice on how much is enough for support of science and how it should be spent. In pursuit of the latter interest, the Congressional Office of Technology Assessment recently produced the most comprehensive study of federal science policy in many years, *Federally Funded Research: Decisions for a Decade* (GPO Stock No. 052-003-01241-3; 314 pp., \$12; order from: USGPO, Superintendent of Documents, Washington, DC 20402-9325; tel. 202/783-3238; add 25 percent for international orders). The study pulls together and analyzes large volumes of statistical data about science, but its main value is its identification of informational and structural shortcomings in the federal system of science support. The big report defies a summary, but a theme that stands out is that the research system keeps rolling on without priorities or criteria for allocating its resources.

On Capitol Hill, the leading expostulator on science-policy matters is Rep. George Brown (D-Calif.), a longtime science aficionado capping his Congressional career with his newly gained Chairmanship of the House Science, Space, and Technology Committee. Brown has adopted an avuncular stance—not unusual among legislators who aspire to be statesmen of science—telling science that it deserves to be very well treated, but that it must be certain that its own house is in order.

Addressing the annual meeting of the American Association for the Advancement of Science in February, Brown

said that "as a politician, I must tell you that unlimited funding for basic research is no longer viewed by the US Congress as a birthright of the scientific community..." It never was, of course, but scientists like that stuff, especially those from afar, because it sounds like hot news from the inner sanctum.

Brown's Committee possesses legislative authority over NSF, NASA, the National Institute of Standards and Technology, much of DOE energy research, EPA, and various other important research areas. Though far from dominant in science-policy affairs, the Committee occupies an influential position. It could initiate steps toward major revisions of policy and practice. But the science enterprise is mature, well-entrenched, and resistant to all changes but more money. Brown's chairmanship hasn't altered that formula. Changes do occur, but usually in odd ways. Thus, after years of indecisive negotiations between academe and government, it took an accidental catastrophe like the Stanford debacle to produce major changes in the indirect-cost payment system. The space station, over which Brown's committee has jurisdiction, is politically faltering, but not on technological grounds. Rather, the House Appropriations Subcommittee responsible for NASA prefers to put the money into housing and veterans care.

Debates over science policy run on, but as can be seen from the above, awesome insights and bold prescriptions are scarce. In the meantime, the most potent forces in American science policy are habit and momentum. With occasional exceptions, next year's programs will be about the same as this year's programs, plus 5-10 percent more money. Several new high-tech projects will be added to the enterprise, but rarely at the expense of killing off old ones. The secret of the system's survival is that it works reasonably well, despite the clamor about crisis.—DSG

... A Form Letter Is Provided to Lobby the Trustees

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member of this Academy [not identified in the minutes] has suggested to the Rockefeller University Board to dismiss [sic] David Baltimore. The Board apparently feels," the minutes explain, "that they could better resist such suggestions if they had some evidence of support from the scientific community."

"Thus, anyone who feels that a dismissal of Baltimore would be inappropriate," the minutes advise, "should write to Mr. Richard Furland, Chairman, Board of Trustees, Rockefeller University, New York, N. Y. 10021. Letters should also be addressed to Philip Leder [Harvard University] and Roy Vagelos [CEO of Merck], members of the Rockefeller Board."

To assist letter writers, the minutes state, "Bernie Davis has prepared a suggested treatment of general support that does not go into any details of the case; he offers this draft as a possible model."

The draft, appended to the minutes, is headed, "Suggested framework for a statement to the Board of Trustees, Rockefeller University. B.D. Davis." The text is as follows:

"David Baltimore has a long and continuing record of exceptional contributions as a creative scientist, effective administrator, and wise spokesman on social aspects of science. His reputation has been seriously damaged by widespread attention to a publication in which a collaborator was charged initially with errors, and now with fraud."

"Whatever may have been Dr. Baltimore's errors of judgment in dealing with this case at various stages, we have seen no evidence that impugns his integrity. We wish to express the hope that the outcome of this controversy will not diminish his ability to use his talents fully in further service to society."

Listed as attending the Section meeting were the following: Igor B. David, Daniel Branton, Donald D. Brown, Eric H. Davidson, Bernard Davis, James D. Ebert, Joseph Gall, John Gerhart, Mark Kirschner, Philip Leder, Arthur Pardee, Robert P. Perry, Keith R. Porter, David Sabatini, Philip Siekevitz, Hewson Swift, and Keith Yamamoto.

The minutes of the Section meeting also reflect rising concern with the tactics employed by the NIH Office of Scientific Integrity (OSI), which conducted the investigation of the *Cell* paper. Scientists under its spotlight, and lawyers defending them, contend that OSI neglects due process and employs strongarm tactics in pursuing scientific wrongdoing. OSI officials staunchly deny the charges, but the din of discontent grows louder.

The minutes state that Philip Siekevitz, of Rockefeller University, suggested that "a motion be brought to the Class II [biological sciences, one of six disciplinary groupings of NAS membership] meeting suggesting that the Academy look into the activities and practices of the Office of Scientific Integrity, in particular into questions of the rights of the accused."

After "much discussion," the minutes report, the suggestion was turned down on the grounds that "the Class meeting was not an appropriate place to deal with this complex issue, especially since we were not sufficiently prepared." It was noted, too, that a major study of scientific misconduct was already in an advanced stage by the Academy's Panel on Scientific Responsibility and the Conduct of Research. "Nevertheless," the minutes state, "many of the members present stated that they considered the issue very important and felt that OSI's actions and practices should be considered by the Academy."

"We concluded," the minutes continue, "that a carefully prepared letter by a member or group of members to [NAS President] Frank Press would be the appropriate vehicle for raising the issue." Members were invited to participate in drafting the suggested letter.

The proposal to write to the Rockefeller Board in support of Baltimore recalls an earlier effort to inspire letter-writing in his behalf. In 1989, at the height of the fraud controversy, a prominent colleague at MIT, Phillip A. Sharp, initiated a successful letter-writing campaign to depict the Congressional and NIH investigations of the *Cell* paper as attacks on science.

In "Dear Colleague" letters to several hundred scientists throughout the country, Sharp, Director of the MIT Center for Cancer Research, referred to a forthcoming hearing by Rep. John Dingell's Oversight and Investigations Subcommittee. "It seems obvious that the Congressional Subcommittee has decided to hassle David [Baltimore] and the authors [of the *Cell* paper] and this has serious implications for all of us," Sharp stated.

Sharp enclosed a "sample letter" to be sent to Congressmen and the press, but cautioned, "please don't use my sample exactly."

The "sample," a feverish melange of misrepresentations, declared that Dingell's inquiries "have intimidated young scientists who represent this country's future" and "have compromised the workings of the American scientific enterprise."

Meanwhile, Dingell is planning hearings on the Baltimore case, sometime this summer, but dates are not yet settled. According to present plans, one hearing will review NIH's handling of the investigation, and a second will focus on inquiries at MIT and Tufts that concluded nothing was amiss.

NSF Social Science Bill Introduced

A bill to establish a Directorate for Behavioral and Social Sciences within the National Science Foundation has been introduced by Senator John Kerry (D-Mass.). The bill (S. 1031) would extract the disciplines from the present submergence in the Directorate for Biological, Behavioral, and Social Sciences. NSF has long been studying the matter on its own, but has not made a move.

National Science Foundation Is Not a Moving Story

For tenacious occupancy of a desirable urban site, it would be difficult to top the National Science Foundation's grip on its downtown Washington headquarters in the face of heavy efforts to dislodge it to a spot in the distant Virginia suburbs. NSF's achievement suggests that its reputation for political naivete may not be wholly deserved.

A move has supposedly been in the works for NSF since at least 1986. But so far, the Foundation remains as firmly fixed as the foundation of the headquarters it has occupied for 27 years. The address is 1800 G St. NW, a few blocks from the White House. The nearby subway system brings Capitol Hill within 15 or 20 minutes. Shops and eateries of many types are easily accessible. As the saying goes, location is everything, and NSF has location.

The difficulty is that the building at that location is both crumbly and co-shared with a tenant who is politically better connected than NSF—the United States Secret Service, which, at least until recently, was pushing for more space in the building. The room available for NSF is insufficient for its staff of some 1400, which necessitates an annex several blocks away. The elevators, notably erratic, held then-Director Erich Bloch captive for half an hour in 1988. The building's primitive wiring complicates NSF's ambitions to computerize its granting operations. There's no auditorium, a grievous lack for a meeting-minded organization. When NSF wants to assemble *en masse*, it must borrow a neighboring hall.

Bloch expressed a preference for moving to another downtown site when the government's housekeeping agency, the General Services Administration (GSA), asked him about it. But in 1989, Barbara Mikulski, who comes from Baltimore, ascended to the chairmanship of NSF's Senate Appropriations Subcommittee. Interested in delivering 1400 federal jobs to Maryland, she modestly took the position that the site search should go metropolitan. With the NSF budget looming as a hostage, Bloch agreed.

Insisting that it would play it straight, GSA advertised for space, and from the many responses for a bid for 350,000-370,000 square feet, it picked a contractor's proposal to erect a building in the Ballston section of Arlington, Va. GSA even signed a lease for occupancy in January 1993.

Was NSF's geographic fate then sealed? So it seemed two years ago. But today, signs of an impending move are lacking at NSF. A budget request last year for \$5.5 million to plan the move and the layout of the building was denied by the House Appropriations Committee following consultations with NSF chieftains. GSA then provided \$700,000 of its own money to help out with planning. This year, NSF asked Congress for \$7 million in the coming fiscal year, toward an ultimate total of \$17 million for planning and moving expenses. The request was denied by the House Appropriations Subcommittee that basically writes the budget ticket for NSF. The Congressional action followed new signs of NSF's preference for staying downtown.

Earlier this year, Mary Good, Chairman of the National Science Board—NSF's top policy body—wrote to Subcommittee Chairman Bob Traxler (D-Mich.) that she was opposed to the move. Since White House Science Adviser D. Allan Bromley has rejuvenated the Federal Coordinating Council for Science, Engineering, and Technology, Good explained, NSF officials are constantly being summoned to meetings at the nearby Executive Office Buildings. Journeys from Ballston, she suggested, might be ruinously time consuming.

In testifying on the budget, Walter Massey, the new NSF Director, also expressed reservations, noting that the \$17 million estimated for moving costs would have to come from NSF's account for salaries and expenses. It would be better to use the money, he said, for hiring staff and buying office equipment.

Opposition has also come from an unexpected source, the NSF Inspector General, whose 12th floor offices at 1800 G St. provide a panoramic view of the nation's capital. The IG's latest semi-annual report to Congress [see *In Print*, p. 8] expresses "considerable concern" about the costs of the move. In 1986, when the move was first considered, IG Linda Sundro writes, NSF anticipated substantial staff growth to manage a rapidly rising budget. Staff growth, however, has been modest, Sundro notes, and with Congress denying NSF special funds for relocation expenses, the \$17 million moving bill "would substantially reduce available support for the Foundation's mission and its staff. . . . We vigorously oppose any such plans to use funds for relocation that would otherwise be available for the agency's basic mission of scientific research and education."

The IG topped by asserting that "it is not, in our view, premature to develop alternatives to the expensive plan now proposed. For example, GSA could obtain a lower-cost lease in an existing building instead of a new building, or lease less space."

Groundbreaking is scheduled to begin any day now at the Ballston site, but an NSF official conversant with the move problem insists that Ballston is GSA's business, not NSF's. NSF's lease on its present building runs to 1995, he noted, and NSF has not committed itself to moving. He also noted reports that the Secret Service has had a change of heart and is now looking for another building.

Jobs Changes & Appointments

Charles Herzfeld has resigned as the Pentagon's Director of Research and Engineering. According to published reports, he's in line to head the Critical Technologies Institute, a Congressional creation appended to the White House Office of Science and Technology Policy, but OSTP tells SGR the post has not yet been filled.

Niels Reimers, a pioneer in making money from research in academic labs, has resigned after 23 years as head of Stanford University's Office of Technology Licensing.

More In Print: SEMATECH, ICSU, Industrial R&D

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the National Endowment for the Humanities. The GAO criticizes a few procedures, but reports no serious violations. The GAO study was requested by Senator John Glenn (D-Ohio), Chairman of the Committee on Governmental Affairs.

Also from GAO: *Federal Research: SEMATECH's Efforts to Develop and Transfer Manufacturing Technology* (GAO/RCED-91-139FS; 16 pp., no charge), a progress report on a rare Reagan-era venture in federal subsidies for industrial technology, the 14-company SEMATECH consortium, established in 1987, with \$100 million a year from the Pentagon, to pool research on semiconductor manufacturing. The GAO report, based on interviews with executives of participating companies, reflects continued interest on their part, but there were no indications of enthusiasm or mention of grapevine reports of waning affection among several of the consortium partners.

Another from GAO: *Federal Research: Assessment of the Financial Audit for SEMATECH's Activities in 1989*: (GAO/RCED-91-74; 15 pp., no charge), reveals that "at least two" of SEMATECH's 14 firms have been charging a portion of their dues as overhead costs for doing business with the Pentagon, which already puts \$100 million a year into the operation. GAO suggests that the tactic is unseemly. It also disapprovingly noted that SEMATECH is making "postemployment payments to its former chief financial officer," but that SEMATECH "declined to disclose those payments because of their immateriality to its financial statements."

Order GAO reports from: USGAO, PO Box 6015, Gaithersburg, Md. 20877; tel. 202/275-6241.

Project 88, Round II—Incentives for Action: Designing Market-Based Environmental Strategies (95 pp., no charge), a design for tying environmental purity to the profit motive, from studies sponsored by Senator Timothy Wirth (D-Col.) and the late Senator John Heinz (R-Pa.), with financial support from the Carnegie Corporation and a large cast of environmental specialists, headed by Project Director Robert Stavins, of the Kennedy School, Harvard. Topics covered include global climate change, solid- and hazardous-waste management, and natural-resource management. The report is a follow-up to *Project 88: Harnessing Market Forces to Protect Our Environment*, also sponsored by Wirth and Heinz.

Order from: Senator Tim Wirth, United States Senate, Washington, DC 20510-0603; tel. 202/224-5852.

Science International (34 pp., no charge), quarterly newsletter of the Paris-based International Council of Scientific Unions (ICSU), umbrella organization of 75 national academies of sciences and science councils and 20 international scientific unions. Consists mainly of reports of ICSU

meetings and publications and coming events.

Order from: ICSU Secretariat, 51, Blvd. de Montmorency, 75016 Paris, France; tel. (33 1) 45 25 03 29; fax. 42 88 94 31.

Key Speeches (24 pp., no charge), published about 10 times a year by the Aerospace Industries Association, a Washington lobby, texts and snippets of talks on aerospace matters by various figures, including, in this issue, Rep. Les Aspin, Chairman of the House Armed Services Committee; Renzo Caporali, Chairman, Grumman Corp., and Deborah L. Wince-Smith, Assistant Secretary of Commerce for Technology Policy.

Order from: Aerospace Industries Association, 1250 Eye St. NW, Washington, DC 20005; attn. Kathleen Linse; tel. 202/371-8400.

Industrial Research and Development Facts (8 pp., no charge), by the Industrial Research Institute, Washington-based association of some 260 major research-oriented firms, basic statistical data on industrial R&D, on which companies are reported spending \$76 billion of their own money and \$33 billion in federal funds this year. From both sources, that huge sum includes a mere \$4.4 billion for basic research.

Order from: Industrial Research Institute, 1550 M St. NW, Washington, DC 20005; attn. Ludita Vallarta; tel. 202/872-6350.

Smithsonian Year 1990 (212 pp., no charge; supply limited), annual report of the Smithsonian Institution, with details of programs in its many museums and research centers, plus budget information, membership of boards and committees, etc.

Order from: Smithsonian Institution Press, 470 L'Enfant Plaza, Suite 7100, Washington, DC 20560; attn. Alan Burchell; tel. 202/287-3738, ext. 326.

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In Print: MIT's Foreign Ties, Genetic Resources, Etc.

The publications listed are obtainable as indicated—from SGR.

The International Relationships of MIT in a Technologically Competitive World (41 pp., no charge), report by an MIT faculty committee on the politically sensitive topic of links between US universities and organizations in competitor nations—for which MIT, with many foreign connections, has drawn criticism on Capitol Hill. The committee, chaired by Eugene B. Skolnikoff, MIT Center for International Studies, recommends that MIT should not impose restrictions on people and collaborations that meet MIT standards, but that special efforts should be made to encourage American industry to benefit from research and other activities at MIT. The report notes that 30 of 215 endowed chairs at MIT are funded by "foreign-based" corporations and that 121 of the 245 corporate members in MIT's Industrial Liaison Program are foreign.

Order from: MIT, Center for International Studies, Room E51-228, Cambridge, Mass. 02139-4307; tel. 617/253-3140.

Office of [NSF] Inspector General: Semiannual Report to the Congress (59 pp., no charge), fourth in the series since Congress mandated IGs for NSF and various other agencies lacking their own inhouse cops. This report, covering October 1, 1990, to March 31, 1991, sketches a small collection of fiscal and ethical misdeeds among NSF's clients. No blockbuster cases are reported, but the report suggests a minor though persistent undercurrent of hanky-panky, corner-cutting on NSF regs, and inattention to accounting requirements. Stepping beyond the normal bounds of IG surveillance, the report also expresses "considerable concern" about the estimated \$17 million moving bill for relocating NSF headquarters from a decaying building in downtown Washington to one soon to be built in nearby Arlington, Virginia [see P. 6].

Order from: NSF, Office of the Inspector General, Room 1241, 1800 G St. NW, Washington, DC 20550; tel. 202/357-9458.

Managing Global Genetic Resources: The US National Plant Germplasm System (171 pp., \$19, US, Mexico, Canada; \$24 overseas; add \$2 for shipping), from the National Academy of Sciences, a critical assessment of the US Department of Agriculture National Plant Germplasm System (NPGS), consisting of some 380,000 accessions, "including all of the crops of interest to US agriculture," stored at various sites throughout the country. The report states that the system "is constrained by the absence of a clear delineation of its duties, programs, and sites," adding that its budget process does not "lend itself to systematic management and timely initiative in areas of critical need or opportunity." The report coyly discusses advantages of removing NPGS from the USDA Agricultural Research

Service "to become a separate entity within the USDA's Office of Science and Education." But it falls short of specifically recommending the move. The committee that produced the report was chaired by Peter R. Day, Rutgers University; 8 of the 14 members are from outside the US. Also from the Academy: **Moving Beyond Myths: Revitalizing Undergraduate Mathematics** (63 pp., \$7.95; add \$3 for shipping), latest in a decade-long series of NAS publications aimed at improving mathematics education. This one is pretty thin, consisting of cheerleading for math and brief challenges to assumptions such as "Women and members of certain ethnic groups are less capable in mathematics." Listed are other publications in the math-boosting genre.

Order from: National Academy Press, 2101 Constitution Ave. NW, Washington, DC 20418; tel. 1-800-624-6242; in Washington metropolitan area: 202/334-3313.

Long-Lived Legacy: Managing High-Level and Transuranic Waste at the DOE Nuclear Weapons Complex (GPO Stock No. 052-003-01243-0; 99 pp., \$4.75), by the Congressional Office of Technology Assessment (OTA), a "technical annex" to an OTA report issued in February, **Complex Cleanup: The Environmental Legacy of Nuclear Weapons Production** (GPO Stock No. 052-003-01222-7; 212 pp., \$10), which described the contamination of ground and water in the vicinity of DOE's nuclear-weapons plants. The new publication reports on cleanup efforts planned and in progress.

Also from OTA: **Energy Efficiency in the Federal Government: Government by Good Example** (GPO Stock No. 052-003-01242-1; 112 pp., \$5), says the federal government could drastically cut its fuel bill—at \$8.7 billion, the largest in the country—if it adopted various conservation techniques. Energy saving on that scale, OTA adds, would also inspire and create markets for new energy technologies. But it says energy conservation has a low priority in the federal establishment.

Another from OTA: **Rural America at the Crossroads: Networking for the Future** (GPO Stock No. 052-003-01228-6; 190 pp., \$9.50), says telecommunications technology can assist economic development in the rural areas, but cannot overcome basic shortcomings in education, health care, availability of capital, etc.

Order OTA publications from: USGPO, Superintendent of Documents, Washington, DC 20402-9325; tel. 202/783-3238; also available from USGPO regional offices. Add 25 percent for international orders.

Peer Review: Compliance With the Privacy Act and the Federal Advisory Committee Act (GAO/GGD-91-48; 30 pp., no charge), by the General Accounting Office (GAO), a review of how confidentiality of grant applicants is treated at six federal agencies—NSF, NIH, DOE, VA, NOAA, and

(Continued on Page 7)

